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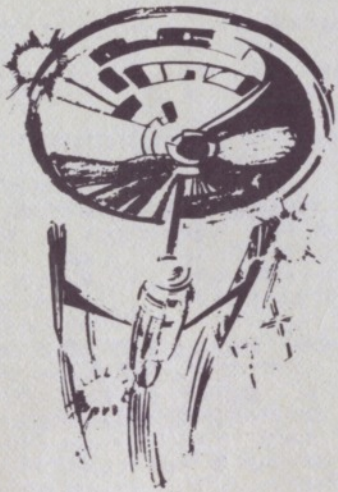
SYNCHRO SETTE



THE SUBSCRIPTION MAGAZINE

FOR THE ZX-81 MICROCOMPUTER

SYNCHRO-SETTE

THE SUBSCRIPTION MAGAZINE FOR THE ZX-81 MICROCOMPUTER

IN THIS ISSUE — JULY 1982

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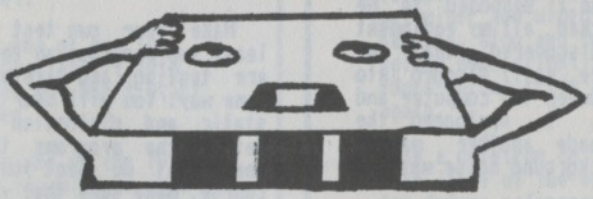
CASSETTE LOADING PROBLEMS



From articles that were written in the APRIL and MAY issues of this year, we went over many of the methods of saving and loading programs to insure proper response.

Some of our subscribers have notified us that they are having problems loading and saving programs on tape.

Three of them had problems loading some or all of the programs from the cassettes we supplied. We asked these people to send us these cassettes for testing and we returned new ones to them.

After testing these three tapes, we found that all the programs loaded perfectly from all of the tapes.

What could be the problem?

Let us examine the possiblities:

THE CASSETTE RECORDER

As you know, many types of cassette recorders are on the market. The better ones can give a better sound quality to the computer. Some have valuable features such as a tape counter so that the user can identify the location of a particular program on the tape and/or a bass/treble adjustment that allows the user to raise the amount of high pitched sounds while the amount of low pitched sounds are automatically being lowered by the control at the same time.

The computer program pulses were produced by the computer as a high pitched sound and must be received back at the same pitch if the program is to load properly.

If the recorder only allows a mid-range sound, then the high pitchs are of a lower intensity and any low pitched sounds that may be on the tape can over-ride the high pitched pulses with interference and cause irregular transfer of data.

However, a recorder with a bass/treble adjustment must be set to allow maximum treble with no bass.

Even with these precautions, problems still can arise. If a program won't load from tape, try removing the cord that goes from the MIC jack of the recorder to the MIC jack of the computer leaving only the cord to the EAR jacks. This prevents many of the unwanted signals from bleeding into the computer and causing audio distortion of the program pulses.

One of my customers that tried this last method, was able to load all the programs off the JUNE/82 tape when previously he was unable to have any of them load.

When saving programs on tape, do the reverse. Leave the MIC plugs plugged in and the EAR plugs disconnected. I personally test each tape before it is shipped to see that the programs load. One of the tests is to listen to the program's audio pulses through a headset with ceramic earphones for noise distortion. One time while listening

to a master tape that I had prepared, I noticed a background noise that wasn't supposed to be there. I checked all my equipment and finally discovered that my headphones were still plugged into the circuit between the computer and the recorder. I unplugged the headset and made another master tape. The background noise was now gone.

What had probably happened was this:

Earphones can operate as microphones in certain situations, picking up sounds from the surrounding environment. In many electronic project books it is shown how to use this effect to create an intercom device that uses a speaker that can act as both a microphone and a speaker. My headset had picked up background noise and sent it to the master tape. The recorder has a speaker for audio output when not used with the EAR jack. It is possible that backgound noise in the room may be picked up by this speaker as it is acting as a microphone and distorting your programs while you are trying to save them. Why leave them in when it is easy to disconect this cord completely.

Try this test yourself by simply turning your TV volume up and listen to the sound as you slowly and carefully pull the plugs from the EAR and MIC jacks of the recorder. You can easily hear that the recorder itself is outputting a signal that shows up as the audio output of the TV changes.

Some of my customers who have had problems loading our programs have listened to the tape playing on the recorder without the plugs in the recorder jacks. They heard a slight static just before the first program and a series of clicks in between the programs.

This is normal and will not interfere with the program loading.

Make your own test tape with at least two programs on the side you are testing and listen to it the same way. You will hear a lot more static and distortion before and between the programs than on the ones that we sent you. Always, of course, make sure that you have run the tape beyond the leader that is on most cassette tapes before you start recording and turn the recorder on in its recording mode before you press the enter key on the computer.

If you still are dubious as to whether the slight amount of static is causing the loading problem, advance the tape beyond that segment and try loading it again.

VOLUME CONTROL

This is one of the more critical areas of getting a proper load of a program. I have discovered a method of determining what I consider to be the exact volume setting for any one given program. Unfortunately for 1K machine owners, this method only works on 16K machines.

Sinclair suggests that your volume control should be set at 80% maximum volume and this is a good rule of thumb for the most part. Some tapes have the ability to produce a much stronger audio output signal at that setting than other tapes.

This results in a screen blitz where the computer hangs up and has to be reset. On the other hand, some tapes produce a lower audio output that results in the screen going white and the cursor returning to the bottom of the screen.

Try this following method on a program tape:

A - Type in LOAD "XXX" but don't enter it yet.

B - Now select one of our 16K program tapes, put it into the recorder but don't start the recorder.

C - Turn the volume of the TV up so that you will be able to hear the audio pulses.

D - Press Play on the recorder and Press ENTER on the computer.

E - Find the portion of the program that has the even sounding pulses. It is usually the last part of the program. There are 24 pulses and this segment lasts 17 seconds.

F - If you have a tape counter, note the location where these pulses begin and where they end. If you don't have a tape counter, time the seconds from the beginning of the tape to the first pulse. You are going to have to return to this segment a few times with the recorders fast forward and reverse keys (do not worry about the computer blitzing while you are stopping, starting and reversing the recorder. The computer is searching in vain for program "XXX" and will not bomb).

G - When you are comfortable with finding the location of the pulses, at the point where the pulses begin, there should be 5 horizontal bars that are very steady. This situation will only last 17 seconds. Before these pulses, the bars do a lot of moving around so you are now going to adjust the volume so that these bars have very straight and clean edges.

H - Start turning the volume up until the bars start getting fuzzy edges (if you turn the volume too high, the bars may get wider and wider). When this happens, stop and turn the volume down slightly until the edges become crisp and straight again.

I - Make a notation on the cassette case itelf of the volume level for future reference.

J - At this point, the volume is set as good as it can be. Hit the BREAK key, rewind the program and reload it in the normal fashion. The program should now load OK.

LOW QUALITY TAPES

Many of us (myself included) have purchased cassette tapes at bargain prices and have used them on our computers with virtually no problems.

These non-computer tapes are designed for sound input where high pitch or fidelity may not be important such as for vocal or some music applications. The attempt to have the tape capture the high frequency sounds may not be successful and the replaying of the tape will easily evidence this effect, especially when we listen to the sounds directly and compare the same input put on a quality tape.

This does not mean that you can not use them. Sometimes however, the tape also has the effect of capturing the sounds in an irregular fashion. If we were to listen to the output of this type of tape we may hear some of the following undesirable effects:

A - Pulses that correspond with the position of the reel of tape as if a magnetic knife had cut through the reel.

B - Drop outs. The sounds may be

uniform in intensity and all of a sudden, the volume drops noticeably resulting in program blitzes. This can be the result of a lack of magnetic particles in that section of the tape caused by inferior manufacturing methods.

C - Uneven dispersion of magnetic particles in the tape causing drop-outs, uneven pulses, distortion, etc.

D - Left over sound pulses from old recordings that were not overlayed by the new program recording.

Many problems can be overcome with a bulk magnetic tape eraser but some are so stubborn as to defy the most rigorous attempts.

COMPUTER MALFUNCTION

This problem is more common with those of us who built our computers from a kit. I have however, heard of some of our subscribers that have received defective computers directly from the manufacturer.

If your computer was built from a kit and is not loading or saving programs properly, check all of the connections for weak solder joints. If the solder joints are good, there might be a defective component. If you suspect a defective kit component or if your ready-built machine does not load the programs and you suspect the machine itself, it probably is best to have an experienced electronics service check it out or send it back to Sinclair for service.

If you have a tape that we sent you that still won't load, send it back to us and we will replace it.

EDITOR RAMBLINGS

NEW PRINTER

Perhaps you noticed the difference in print quality in this month's issue as compared to our previous issues. The first three issues were formated with an Epson TX-80 (not MX-80 but its predecessor) printer.

This printer was a dot matrix type with a 5 by 7 pin head. For those of you who are wondering what that means, it is simply that the printer has a device that has a bunch of little pins that are controlled in such a way so that some of them are allowed to strike a ribbon like that used in a typewriter to form the pattern of the individual characters that are desired to be printed on the paper on the other side of the ribbon.

This print head travels in a straight line across the paper and prints the characters during its travel. This type of printing is different of course from the type that you see from a typewriter where there is a key for each individual character.

If you look at the printed characters of our earlier issues, you can see the individual dots that comprise many of the characters.

The printers that are being sold for the Sinclair computers operate differently. There is no inked ribbon. The paper is called Thermal Paper and has metallic particles in it. The print head shoots little sparks at the paper which causes that portion of the paper to become discolored and the characters are formed. The drawback of this type of printer is that the text is harder to make good copies of and the paper is much more expensive. Also the paper is not as wide as that used in plain paper printers.

The printer we use now is the PROWRITER made by ITOH. It has a 7 by 9 dot matrix with all sorts of bells and whistles. It has in its parallel mode four different font (character) styles, three different sizes if each font, variable line spacing from 1/144", will feed paper through either friction or tractor feed mechanisms, prints bi-directionally with a logic seeking feature and will print at a maximum of 120 characters per second. The carriage roller can be made to move in either direction which along with a contained graphics generator gives it plotting capabilities.

It has descenders on its lower case letters (g,j,p,q and y -

compare with our earlier issues).

It also has the capability to print in a mode called BOLD. What this means is that each pin strikes the paper twice at approximately the same location. This not only makes the characters appear darker but blends the dots into each other so that the final effect is closer to letter quality printing.

SPECTRUM NEWS

Reliable sources tell us that the intended market price of the 16K Spectrum computer as sold in the U.S.A. will be 199.95 and the 48K version will sell for around 275.00.

The disk drives are now estimated to be sold for 89.95 each.

LARRY WEIGEL'S KEYBOARD

Mr. Weigel tells me that the enclosed keyboard will be selling for 89.95 and not 79.95 as it appeared on the MARQUEE-2 JUNE/82 cassette program.

NEW PRINTER FROM CAI

In a conversation with Robert Swan of CAI Instruments, 2559 Artubus Ct., Midland Michigan, 48640, 517-835-6145, a new printer has been added to their line of available hardware for the ZX-81 computers. Instead of 32 characters across the paper, it will print up to 40 characters across and sell for 119.95, 20 dollars more than their 32 column printer. It still needs their CAI/O board interface that sells for 69.95 with either printer. These items are available now for immediate shipping.

FLAT SCREEN TV

Due from Sinclair Research later this year is a flat screen battery powered pocket TV about the size of a pocket dictionary. The tiny tube measures 4 by 2 by 3/4 inches and is three times brighter than a conventional 3 inch CRT but is said to require only one fourth to one tenth the operating power.

The electron gun that transmits the beamed signals sits off to the side of the screen. The projected beams strike the same side of the screen that the viewer observes resulting in a sharper and brighter image.

The technique of focusing the electron stream into a round beam rather than an eliptical one that would distort the picture, fills the screen with an evenly distributed projection pattern including edges and corners.

The prototype has a built in antenna and FM radio and the projected retail price is around $100.

This TV along with the ZX-81 or Spectrum would make an excellent portable computer system particularly for students.

The power drain of the ZX-81 from a 9 VDC battery is considerable and would discharge a conveniently sized battery in a short amount of time. However a portable system in a briefcase could hold a larger battery and AC recharger with no difficulty.

Can a pocket color TV be far off? It can be done according to Sinclair but he's not going to do it.

A U.S. retail chain has expressed interest in marketing the device which means we may be able to buy it across the counter rather than mail order.

the Computer Tutor

ZX-81 WORD PROCESSING

TEXT FORMATING

On the APRIL/82 cassette there was a 1K program called INSTRING. This program allowed you to enter a large group or words and then enter a smaller word or group of words. The routine in that program would then search through the large group for the smaller group and if the smaller group existed in the larger group, the coordinate positions of the smaller group would be pin-pointed in the larger group.

This is one of the routines used in word processing programs and is useful for locating mispelled words so they can be corrected.

Another routine allows the user to enter text continuously without having to worry about a carriage return like on a typewriter.

The following program allows the user to enter text in this manner and when the enter key is pressed, the text will automatically be formatted in lines with a maximum of 20 characters each:

```
10 INPUT A$
20 IF LEN A$ < 21 THEN GOTO 200
30 LET B$ = A$( 1 TO 20 )
40 FOR N = 20 TO 1 STEP -1
50 IF A$( N ) = " " THEN GOTO 100
60 NEXT N
100 LET B$ = A$( 1 TO N-1 )
110 PRINT TAB 6; B$
120 LET A$ = A$( N+1 TO LEN A$ )
150 GOTO 20
200 PRINT TAB 6; A$
```

This program will run on a 1K machine and will allow a lot of character input without running out of memory.

RUN the program and enter about 3 or 4 lines of text. Do not worry about making the words appear whole on the screen. The broken words that appear at the end of the line and continue at the beginning of the next line are called - wrap-around - words. As the text entered approaches the end of the screen, just keep entering the letters and null spaces as if you had plenty of room left. Keep doing this until you have no more text to enter and then press the ENTER key.

Pretty nifty, huh?

You will notice that the wrap-around words have been automatically formatted with no broken words appearing on the screen. Stop and think of the power and speed that is achieved with such a small program.

In line #10, the string variable A$ is assigned the value of whatever you enter as text. Line #20 looks at the length of that variable to see if it is 20 characters or less in length and if it is, it shoots it to line #200 which prints it with 6 empty spaces before it and then the program is ended.

If the length is over 20 characters, a new variable, B$ is assigned to be the first 20 characters of A$ in line #30.

Lines 40 to 60 set up a FOR/NEXT loop that searches from the 20th character of variable A$ backwards to the first character of A$ for a null space. When a null space is encountered, line #50 goes to line #100 where B$ is told to take on the characters of A$ from the first character to the last character before that null space.

Line #110 then prints B$ with 6 empty spaces before it and then line #120 resets A$ to be equal to the characters to the right of that null space.

Line #150 sends the routine back to line #20 to start the process all over again with a newly shortened A$.

This cycle continues until a truism is encountered in line #20 and then line #200 ends the program.

Pretty simple, huh?

This is how a word processor truncates text lines without breaking words in half but most word processors are written in machine language and operate up to 400 times as fast as BASIC.

But what if we wanted to control the maximum amount of characters per line and wanted to be able to change that amount if we wanted to without re-entering the text!

CHANGING TEXT LINE LENGHTS

Add the following lines to the program:

```
11 LET C$ = A$
15 INPUT A
16 CLS
210 LET A$ =C$
220 GOTO 11
```

And change the following lines to read:

```
20 IF LEN A$ ( A THEN GOTO 200
30 LET B$ = A$ (1 TO A + 1)
40 N = A +1 TO 1 STEP -1
110 PRINT TAB 16 - A/2; B$
200 PRINT TAB 16 - A/2; B$
```

This revision takes much more memory to run and may not work on a 1K machine.

Now when you RUN the program, you find that after you enter the text, another prompt is displayed. This asks you for the maximum amount of characters you want in a line. When the lines are printed, each will be TABed an amount equal to half of the amount of 32 less the length of the longest line. This way the center of the longest line is in the center of the screen.

Immediately after you enter the text and the formatted text is displayed, a prompt appears on the bottom of the screen. You are being asked for a new maximum line length. The text is still held in memory and unlike the first version. You can now experiment with different line lengths.

To exit the program, ENTER a letter or 0 when this prompt appears (some letters used in the program as variables won't work).

Impressed so far? You aint seen nothing yet.

JUSTIFYING THE RIGHT MARGIN

So far the left margin has been justified to allow the center of the largest lines to appear in the center of the screen. The ends of the lines are not lined up in any particular order (unless you were extremely lucky as to the text you entered).

Ever wonder how those printed pages of text got their neat margins justified on the right side. Look at the text in this magazine and others. Here is one of the ways it can be done.

Enter the following lines:

```
185 IF LEN B$ <> 20 THEN GOSUB 300
300 LET L = LEN B$
310 IF L = A THEN RETURN
320 FOR X = 1 TO L
330 IF B$(X) = " " THEN GOTO 500
340 NEXT X
350 GOTO 300
500 LET B$ = B$(1 TO X) + " " +
    B$(X + 1 TO L)
510 LET L = LEN B$
520 IF L <> A THEN LET X = X +1
530 IF L <> A THEN GOTO 340
540 RETURN
```

These additional program lines build a routine that searches each line for null spaces and injects an additional null space to each one in order until the length of the line is equal to the original length you specified.

This method produces all the lines (except for the ending line) having their margins justified and the text is centered on the screen.

One of the other general features of word processors is to allow the user to see the truncated text on the screen as it is typed in. The ZX-81 has the potential to accomplish this with the INKEY$ command. This is more than I want to include in this month's lesson but it is something you might try to do yourself in your spare time.

Did I hear someone groan?

You might use the following routine as a start and then try to combine it with the rest of the program.

```
1000 LET A$ = " "
1010 LET B$ = INKEY$
1020 IF B$ = "" THEN GOTO 1010
1030 IF B$ = "#" THEN B$ = " "
1040 LET A$ = A$ + B$
1050 PRINT AT 0,0 ; A$
1060 PAUSE 10
1070 GOTO 1010
```

This routine allows you to have your characters printed at the top of the screen. You cannot, however, hit the SPACE key and get a space between words because when the computer is in the INKEY$ mode, the SPACE key acts as a BREAK key. Line 1030 allows the (#) to act as a space. The PAUSE 10 in line 1060 is important because without it, you would get what is called keybounce which allows multiple characters to appear on the screen when any key is depressed. It also gives a slight pulse to the screen that lets you know when a character has been entered, particularly blank spaces.

This should prove an interesting exercise to combine all these routines into one program that would allow the user to see how a real word processor works.

We plan to write one in the future with editing and block movement features, with end of paragraph command and scrolling features, either up or down.

If, however, someone would like to write one and submit it to us, we would be happy to print it in our magazine.

There's the bell! See you at next class meeting!

LETTERS TO THE EDITOR

The following changes in the 1K program, MORTGAGE-1 on the JUNE/82 CASSETTE allow a more efficient running of the CRT according to W. F. of Depew N.Y.:

```
150 LET M = INT ((.005 +
    P*I/T)*100)/100
180 LET A = INT ((P*I + P*I/T)/100
```

Change lines 190 and 200 to eliminate variable B and use variable A throughout. Delete lines 20, 40 and 60 and on a 1K machine, about 6 lines of printout are observed on the CRT before the CONT command is needed.

He also writes:

I have found MARQUEE-1 to be a very interesting application for the computer. That program #5 on page 8 (APRIL/82 -ed.) was one of the most useful subroutines I have seen presented on the ZX-81 so far. It can be used to list numbers by simply adding VAL to line 100 in the proper place.

Too bad you couldn't have written thw manual for Sinclair.

Dear Editor,

How can I simulate the ON statement as in other micro-computer BASICs from a program menu to GOTO different line numbers in a program?
C.W. Chicago, IL

What C.W. is refering to for those of you who are not familiar with program menu structure is a method of entering a number or letter into the computer when the program asks for you to make a decision as to what you want the program to do and then branching from that part of the program to another line number.

This is covered somewhat on page 53 of the owner's manual. The user would input a number that would be contained in a variable such as (A) and the next line of the program would go something like this:

```
ON A GOTO 1000,2000
```
or
```
ON A GOTO 1100,1200
```

To simulate this on the ZX-81, the user would write:

```
GOTO 1000 * A
```
or
```
GOTO 1000 + (A * 100)
```

Ed.

Dear Editor,

I have a ZX-80 with the 8K ROM. I tried to run the 1K programs on the APRIL/82 cassette but was unsuccessful with some of them.

SPIDER-DAN gives a report of B/110. MINEFIELD 1 & 2 asks HOW MANY MINES? and I don't get to see the man burying the mines at all. In RALLY I get a report of 0/190 and I don't get to play at all.

Could you please explain why these programs don't work?

J.M.H. - Baldwin Pk., CA

Happy to. This is mostly our own fault. When we received our ZX-81 that we use to write the programs, we were under the impression that the 8K ROM conversion would make the ZX-80 operate exactly like the ZX-81.

It of course didn't. The converted ZX-80 does not have the SLOW mode of the ZX-81 which allows flicker-free moving graphics to occur on the CRT.

The only way to overcome this on the converted ZX-80 with normal BASIC programing techniques is to introduce the PAUSE command into the

appropriate places of the program.
In the future we plan to include the intructions needed for ZX-80 programs conversions if they are possible - Ed.

Dear Ed,

In the program BIORHYTHM on the April cassette, I have found three program lines that do not properly evaluate the user's age. To correct, make these following changes:

570 IF INT J/4 =... change to
IF INT (J/4) =
660 IF INT (C3-1900)/4 <> ... to
IF INT ((C3-1900)/4) <> ...
895 IF INT (C3-1900)/4 = ... to
IF INT ((C3-1900)/4) = ...

The additional parenthesis are needed because INT, as well as all other functions, is evaluated before multiplication, division, addition and subtraction operations are performed.

I enjoy reading your publication very much.

D.K. Golden Valley MN

Thank you for the insight. When I wrote the program, it originally was for another computer whose BASIC interpreter allowed proper response without the extra parenthesis. Just goes to show you that even though a program can be written verbatim from another computer's dialect doesn't mean it's going to work properly - Ed.

The computer wants me to poke that memory location again. It says it feels good!

SHORT PROGRAM ROUTINES (cont.)

```
110 SCROLL
120 PRINT TAB 10; B$( 3 TO LEN
    B$); TAB 20; EB

130 LET TC = TC + VAL B$( 3 TO
    LEN B$ )
140 GOTO 50
200 LET EB = EB - VAL B$( 3 TO
    LEN B$ )
210 SCROLL
220 PRINT B$( 3 TO LEN B$);
    TAB 20; EB
230 LET TD = TD + VAL B$( 3 TO
    LEN B$ )
240 GOTO 50
300 SCROLL
310 SCROLL
320 PRINT TD; TAB 10; TC; TAB 20; EB
330 STOP
1000 SCROLL
1010  PRINT "DEBIT"; TAB 10; "CREDIT";
TAB 20; "BALANCE"
1020 SCROLL
1030 PRINT TAB 20; EB
1040 SCROLL
1050 RETURN
```

TITLE

This routine allows the user to input a title or message and automatically encases it in a border and places it in the center of the screen for a few seconds (change line 130 for a longer time). The screen will then clear and await the next mesasage to be entered.

The user is limited to 26 total characters including spaces and this program will RUN in 1K. Just press ENTER when you are finished.

```
10 INPUT A$
20 IF A$ = "" THEN STOP
30 DIM B$( LEN A$ + 6 )
40 FOR N = 1 TO LEN A$ + 6
50 LET B$ (N) = " inverse * "
60 NEXT N
70 PRINT AT 8,0;
80 PRINT TAB 13 - LEN A$/2 ; B$
90 PRINT TAB 13 - LEN A$/2 ;
   " inverse * "; TAB 18 + LEN
   A$/2 ; " inverse * "
100  PRINT TAB 13 - LEN A$/2 ;
   " inverse * "; TAB 16 - LEN
   A$/2; A$; TAB 18 + LEN A$/2 ;
   " inverse * "
110  PRINT TAB 13 - LEN A$/2 ;
   " inverse * "; TAB 18 +; LEN
   A$/2 ; " inverse * "
120  PRINT TAB 13 - LEN A$/2 ; B$
130 PAUSE 200
140 CLS
150 GOTO10
```

HINT - Line 100 is the same as line 80. Line 110 is the same as line 70. Edit lines 70 and 80 and change the line numbers from 70 to 110 and from 80 to 100. The original lines will remain intact.

This is a routine I use to create the bordered titles I use for the articles in this magazine. I also use it for the mailing lables you see on the envelopes.

CHECKBOOK

Here is a simple program that you can use to balance your checkbook. It also is written in 1K and will keep a running balance, total debits and credits and display each entry in its proper column.

If an entry is a check or bank service charge, it is a debit. A check for the amount of 125.66 should be entered as:

D 125.66

A bank service charge of 6.48 should be entered as:

D 6.48 or D 6.4

A deposit or bank mistake in your favor (ha ha) is a credit and a deposit of 5000.00 (don't we wish) would be entered as:

C 5000.00 or C 5000

The first prompt that appears on the screen asks you for your beginning balance. The next prompt and every one thereafter asks you for a credit or debit amount.

If you have no more to enter, just press enter and the last line totals the debits and credits.

The program is as follows:

```
10 LET TC = 0
20 LET TD = 0
30 INPUT EB
40 GOSUB 1000
50 INPUT B$
60 IF B$ = "" THEN GOTO 300
70 IF B$ (1) = "C" THEN GOTO 100
80 IF B$ (1) = "D" THEN GOTO 200
90 GOTO 50
100 LET EB = EB + VAL B$( 3 TO
   LEN B$ )
```

CONT. ON PAGE 13

USER'S GROUPS

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